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ABSTRACT

This document is a summary account of the proceedings of the first in a series of informal meetings convened by the Office of Sea Grant (OSG) to further marine education in the United States. The document should assist educators participating in future meetings by making it possible to avoid the necessity to re-define basic concepts and principles. No attempt has been made to prioritize, shorten, or highlight any of the items that were discussed. Items include statements by Bob Shephard and by Barbara Spector (Program Director, National Sea Grant College Program). Areas addressed in Shephard's statement include: general and OSG organization; support for marine education, pass-through funding, National Sea Grant support for marine education, and others. Areas addressed in Spector's statement include her responsibilities, nation-wide perception of needs, money for quality assessment workshops, marine education's needs, list of most pressing needs, education components within different Sea Grant programs, and others. Additional items included are the luncheon meeting notes; vocabulary; other activities/discussions; and possible Sea Grant-Cooperative Extension (4-H) cooperation. Three appendixes and handouts given out at the meeting are also provided. Among the information presented in the handouts are education/training goals and objectives for marine education and statement of role of state marine education coordinator. (JN)

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PROCEEDINGS

OF

NATIONAL SEA GRANT COLLEGE PROGRAM

MARINE EDUCATION LEADERS' MEETING

February 21, 22, 1979

6010 Executive Boulevard

Rockville, Maryland 20852

Compiled by:
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(April 1979)

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Preface

This document is a summary account of the proceedings of the first in a series of informal meetings convened on February 21 and 22, 1979 by the Office of Sea Grant (OSG) to further Marine Education in the United States.

No attempt has been made in the present document to prioritize, shorten or highlight any of the items that were discussed. It is intended to give the reader a "you were there" account. All participants contributed to these notes.

It is hoped that this detailed document will eventually serve as a public 'corporate memory' to have all Sea Grant Marine Educators operate on the basis of common assumptions. The document should assist educators participating in future meetings by avoiding the necessity to re-define basic concepts and principles.

I. PREPARATION FOR THE MEETING

In January 1979 a request was sent by the National Office of Sea Grant to all Sea Grant Directors asking them to submit the name (or names) of Marine Education leaders in their programs with a national perspective of Marine Education and a good insight into their own program. Eighteen participants were invited to the meeting. The list of participants is attached (Appendix I).

Participants were asked to perform the tasks outlined in the letter from Dr. Spector dated February 7, 1979. (Appendix II). These tasks resulted from an informal needs assessment that revealed the need to focus (a) upon management procedures within the education component of both individual Sea Grant Programs and the National Sea Grant office and (b) upon issues related to education projects that were completed or were in progress. Participants were asked to explore and formulate their thoughts in this respect before the meeting.

II. THE MEETING.

The world of water challenged Sea Grant Educators to their utmost when the blizzard buried Washington D.C. February 19, 1979. This was the same day participants were enroute to this meeting in Rockville. The meeting was postponed for twenty-four hours. Even then, Sea Granters encountered water in numerous forms, everything from snow to sleet, rain,

and fog. Six of the eighteen invitees succumbed to these perils after making valient efforts to reach the Nation's Capital. They were blocked anywhere from their home airports, to intermediate stop-overs, to Washington's National airport ground traffic jam.

The twelve surviving adventurers joined Bob Shephard and Barbara Spector for two days of stimulating discussions.

The meeting was geared toward the identification of specific goals and tasks that would have to be performed by OSG and the meeting participants, the results of these activities to be made available to the Sea Grant network throughout the nation.

A. Statement by Bob Shephard.

1. Organization - general

Bob Shephard defined OSG, the Sea Grant network, and the interaction of the two. (See The Sea Grant Education Initiative for K-12 and Related Teacher Training). He explained the organization of the Regional Sea Grant Programs such as PASGAP and NEMAS. He also noted that education programming could fit into these regional arrangements.

2. Organization - OSG

Bob described the new organizational structure in OSG. (see Appendix III). He is Associate Director of the Human Resources Division, the outreach arm of Sea Grant that includes the education component. A brief history of the management of Marine Education in OSG was given including reference to the experiences and roles of Tom Murray, Jim McCloy and

Warren Yasso. Bob described Barbara Spector's role as that of a manager responsible for all education endeavors including involvement with K-12 and related teacher training, community college, undergraduate and graduate school activities. He indicated that K-12 and related teacher training activities were to constitute this year's priority effort. He commented on the broad scope of the job and indicated that expectations for outcomes needed to be tempered by realization that this was a one-person assignment.

3. Structural Relationships between SG and other NOAA components.

Bob described the structural relationship between Sea Grant and Coastal Zone Management (CZM). Both are part of NOAA and the K-12 educational endeavor of CZM is coordinated under the Sea Grant umbrella.

4. Support for Marine Education.

Bob also announced that Sea Grant will support Marine Education, whether or not other agencies or individuals wish to become a part of the initiative. The approach will include a united effort from within Sea Grant and the Sea Grant network, with an emphasis on team work. As in all Sea Grant efforts, state and federal components will work in partnership, with the national office serving as facilitator.

5. Pass-through funding

"Pass-through" funding will be the way of the future, with money from other agencies being funnelled through Sea

Grant and coming under Sea Grant management. There will be Sea Grant money in education as long as the states in which the Sea Grant programs are located are interested in marine education.

6. Priority for Marine Education funding.

While there is no "national umbrella" that specifies the slot into which Marine Education must fit in every program, Marine Education positions have as much priority as Marine Advisory positions, and can be funded on the same continuing basis. Projects may change, but people and positions remain. If a state says that education is important (which is essential for full Sea Grant support), then that state can expect Sea Grant support for education.

Relatively few Marine Education Programs report through Marine Advisory Services, and Sea Grant is most interested in ensuring that the two groups get together to discuss their different and overlapping needs. Bob said "I want to explode the myth that there is some attempt by Advisory Services to swallow Marine Education. That couldn't be further from the truth."

Without question, Marine Education is an area into which we are moving very strongly. The manner in which individual Sea Grant Programs are organized is left to the various Sea Grant Directors to decide; the establishment of Marine Education leaders (directors, coordinators, etc.) who report directly to the Sea Grant Director is definitely in line with the way we see the setup.

7. National Sea Grant support for Marine Education.

Bob presented a very positive picture as to the National Sea Grant support (other than dollars) for Marine Education. As National Coordinator / Director, he has personally taken a clear stand and will further our efforts whenever possible.

Bob also stated his commitment to keep Barbara free to work solely on the education programs.

8. Concerns.

The group was concerned to improve channels of communication with the education network to identify priorities and solve critical problems such as quality control, dissemination, program overlaps, etc.

Bob warned the group of the dangers of setting up workshops without precise priorities having been well established in advance. He recommended "piggy-backing" on other Sea Grant meetings to bring marine educators together.

9. Hal Goodwin

Hal Goodwin added "As K-12 education takes off, it will look less and less like an Advisory Services operation. Most Marine Education programs will be unlike advisory service activities and will not fit well into the Advisory Services program. Look out guys - here comes Marine Education!"

B. Statement by Barbara Spector

1. Principal responsibilities

Barbara's perception of her principal responsibility to the Sea Grant network is to act as facilitator: To ease the path of educators to accomplish those tasks they consider necessary to promote marine education. She identified these

important goals: (a) To enlarge the resource base (particularly dollars) from which educators can draw. (b) To improve the channels of communication within the network (i.e. arrange for meetings, conference phone calls etc.) (c) To obtain sanctions from the formal national education structures to gain Sea Grant Educators' entry to schools and access to teachers.

2. Goals in Washington D.C.

In Washington D.C., Barbara has worked towards the following goals: (a) to make people in the D.C. system aware of the need for Marine Education, (b) focus attention on the Sea Grant Education thrust in K-12 and on related teacher training needs (c) establish a liaison network for Marine Education in the D.C. establishment (d) identify and begin forming a resource base, both human and material (e) initiate Marine Education awareness and subsequent activities in selected professional educators' organizations.

Highlights of her accomplishments to date are included at the end of the document, The Sea Grant Education Initiative for K-12 and Related Teacher Training. Some additional accomplishments between February 22 and April 9, 1979 are noted in the addendum to these proceedings.

3. Nation-wide Perception of Needs.

Barbara enumerated the needs that Sea Grant educators across the country have communicated to her: (a) establish a common vocabulary to provide more effective communication (b) identify the various organizational arrangements presently

in use to manage marine education activities within different Sea Grant programs, make these alternative designs known to all Sea Grant programs (c) disseminate what programs are doing in order to stop "reinventing the wheel" and facilitate "stealing the best and inventing the rest" (d) design ways to make use of the capabilities of State Education Agencies to promote Marine Education (e) to obtain entry to local school systems (f) explore the various pathways for cooperation between the Office of Sea Grant and NMEA and other Marine Education Associations (g) coordinate OSG activities with those of the Sea Grant Association directed toward education (h) learn how copyright law applies to Sea Grant funded materials (i) finally, Barbara reiterated the needs that had been identified by the Sea Grant Association Marine Education Committee in October 1978:

ASSUMPTIONS

1. That, to assist our definition of the goals of marine education, we, the members of the Marine Education Committee of the Sea Grant Association, hereby adopt Harold Goodwin's document, The Need for Marine and Aquatic Education.

2. That the initial focus of the Marine Education Committee of the Sea Grant Association shall be directed toward institutions of formal education which may include K through 12, undergraduate, graduate and continuing

education. BASED ON THESE ASSUMPTIONS, WE THE MARINE EDUCATION COMMITTEE OF THE SEA GRANT ASSOCIATION MAKE THE FOLLOWING RECOMMENDATION:

(1) That there be called a two-day conference consisting of selected personnel from the Marine Education Committee and the Marine Advisory Service.

(2) The purpose of the conference shall be to define the foci of educational areas common to and unique to each of the aforementioned groups.

(3) The format of this meeting shall permit each group to meet independently to set priorities for marine education thereafter to meet jointly and to ultimately reach a consensus.

(4) It is recommended that a permanent position be created at the Office of Sea Grant in Washington for the purpose of acting as liaison between NOAA and USOE.

(5) That such a person have responsibility to act as a spokesperson for Sea Grant marine education efforts and to design, initiate, implement and maintain communication channels among Sea Grant educators.

(6) That the Olympia recommendations presented by Ray Pariser of MIT be discussed and suitable implementation be taken.

(7) To further these ends, a conference committee of the Marine Education Committee has been formed to help in the implementation of these recommendations.

(8) The second segment of this conference shall be to set up evaluation criteria to further aid in the MEMs system. A

list of potential readers and reviewers has already been drafted to utilize existing expertise within the Sea Grant community.

4. Needs presented to FICE

Barbara also addressed the needs that were presented to the FICE Sub Committee on Environmental Education in January 1979, resulting from an informal needs assessment on the "state of the art" of Marine Education in the U.S. today.

Needs exist in two main areas: (a) material resources and (b) communication.

(a) Material Resources

There is a need to identify resources, assess their content quality and applicability, and make them available to others. Therefore, these tasks are suggested:

(i) Refine and expand the draft of the Categorical Index of HEW Education Division Programs that could be used for Marine Education efforts. Expand the draft to include those Federal agencies represented in FICE.

(ii) Initiate a process to identify Marine Education-related projects presently being funded by federal agencies.

(iii) Sponsor a workshop to formulate a Marine Education framework derived from the document Fundamentals of Environmental Education (FICE 1977)

(iv) Identify ME programs in the U.S. that are already in place.

(v) Assess quality, content and applicability of programs and materials.

(vi) Create an index of exemplary programs including an abstract and sources of support.

(b) Communication Among Marine Educators

There is a need to enhance and expand communication among those interested in Marine Education. Such people are in colleges, universities; Federal, State, and Local Education Agencies; professional education organizations; Natural Resources, Environmental/Conservation organizations; and business and industry. It would be desirable to maximize opportunity for human contact to facilitate direct communication and information exchange. Therefore, these activities are suggested:

(i) Sponsor a workshop for Marine Education Coordinators from each of the State Education Agencies. This meeting would serve to inform these coordinators of the available support system and resources (human and material), in addition to updating the state of the art of Marine Education. (In November, 1978 the Council of Chief State School Officers' Committee on Marine Education recommended that each state education agency appoint a coordinator for Marine Education - see attachment)

(ii) Sponsor a meeting for Title IV Directors from all the states to encourage these directors to devote part of their Title IV money to Marine Education activities i.e. contribute to the development and validation of program models to be incorporated into the National Diffusion Network.

5. Money for Quality Assessment Workshop

Barbara presented the group with the possibility of working

with George Lowe in securing monies from O.E. for specific workshops on the quality assessment of educational materials and the setting of criteria for future curriculum projects. The Marine Educators were given the task of sketching their ideas on (1) how to establish quality criteria for the development of curricula (2) who would-should be involved in this task, and (3) how such evaluations could be made available. It was decided that Ray Pariser would establish an ad hoc committee to perform this task, and that Barbara would follow through with George Lowe.

6. Marine Educators' Meetings

It was suggested that the Sea Grant Educators continue to "piggy-back" on the National NMEA Conference, but instead of meeting the day before, meet 3 days before NMEA, allowing 2 days for meetings and 1 day of rest.

The rationale for this suggestion:

- Allow Sea Grant Educators to meet without NMEA members feeling discriminated against, and in a relaxed atmosphere. It was noted that in the last 2 years the meetings included any and all who arrived early for registration to the conference.

- It would be cost-effective, using money for 1 long-distance trip instead of for 2 or 3. The only extra cost would be an extra day or two hotel/food bill.

- Allow a breather between the workshop and conference to prepare for the NMEA conference.

- Allow Sea Grant personnel time to interact.

Given that the NMEA Board needed time before and/or after the Conference to meet, the two groups would have to coordinate their efforts.

7. List of most pressing Needs

Early in the meeting, Barbara had asked participants to voice their most pressing concerns for Marine Education, nation wide. This is the list of concerns, as perceived by the participants in the order stated, without prioritizing or weight-listing:

(i) How continuously will funding support be forthcoming from OSG?

For projects

For personnel

(ii) Develop a statement concerning the philosophical mandate to OSG (re marine education) from the Sea Grant network to help indicate where and how OSG could best serve the network.

What are the program goals?

What are the directions that the network and OSG should take?

(iii) Dissemination (distribution) of educational materials?

(iv) Need for much more effective communication within and outside the network;

(v) Need to learn about other marine education programs pursued outside the Sea Grant network;

(vi) Definition of network interface with the OSG. Funding topics.

(vii) Definition of network interface with the SEA's funding topics.

(viii) Local needs in the field of marine education should be known and seriously considered; need to identify one responsible marine education person in each program.

(ix) Circumscribe qualifications, and list names, of people from within and outside the Sea Grant program who can and are wil-

ling to help in the evaluation of education materials. Action people.

(x) Need for efficient marine education management - both at the OSG and the local levels.

(xi) State and federal agencies need to understand the Sea Grant system (re State Education materials distribution system).

(xii) Research needs concerning the learning process.

(xiii) Incorporate Research and Advisory material into the marine education effort.

8. Existing Management Structures for Marine Education Components within different Sea Grant Programs

The following three types of structures appear to be dominant in the Sea Grant network. There are other organizational combinations and variations that have also proved to be successful in local applications.

ASSUMPTIONS

(a) No judgements are implied here as to the relative efficiency and/or effectiveness of each of the different management structures mentioned below.

(b) Structure and management of the different Sea Grant Programs' research components are beyond the scope of the schemes discussed below.

(c) Structure and management of the marine advisory components--other than those addressing formal K-12 marine education efforts-- are also beyond the scope of these schemes.

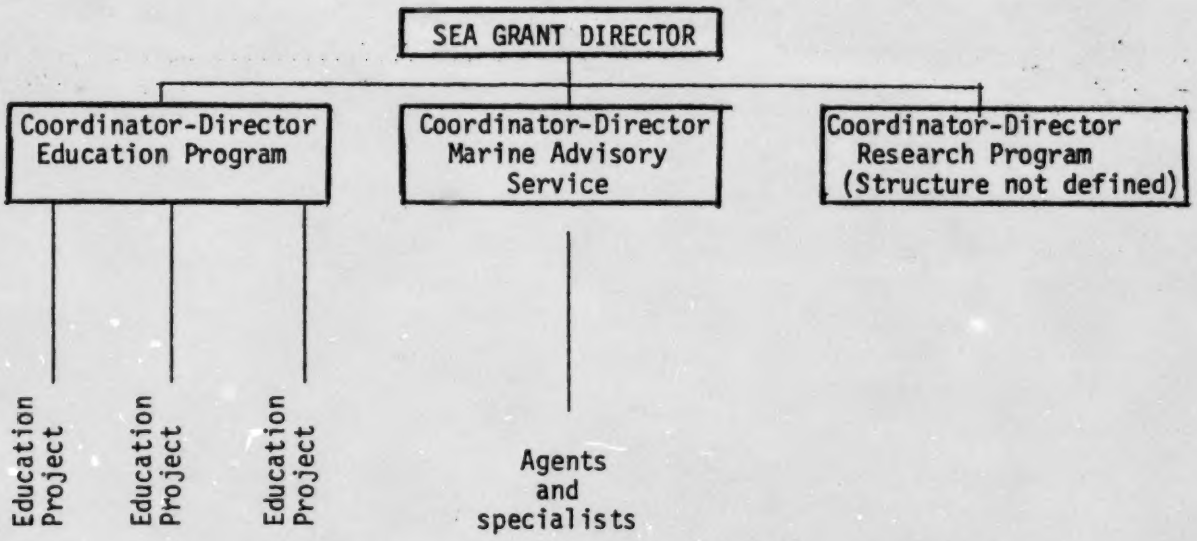
(d) Organization of the research and advisory components are indicated here to show only their overall structure and relationships within the programs.

(e) The relationship between the marine advisory service and

the formal K-12 marine education program is determined by the institutional directors to fit the needs of the particular Sea Grant Program.

Model #1

Diagram



Characteristics

A. In this model, there exist (1) an education component that is separate, distinct and co-equal with the marine advisory service component: and (2) an individual, other than the Sea Grant Director with defined programmatic and/or managerial responsibilities for the education component.

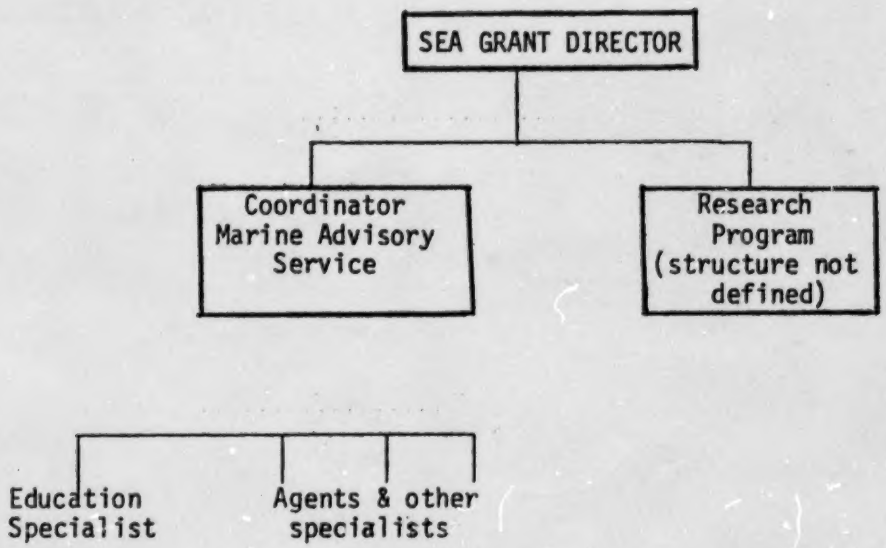
B. Each education project has its own principal investigator (who may or may not be a different individual from the coordinator of the education program).

C. The education component may or may not be closely integrated with the marine advisory service but each education project focuses on

specific educational needs.

Model #2

Diagram



Characteristics

A. The education component is a subset of the marine advisory service.

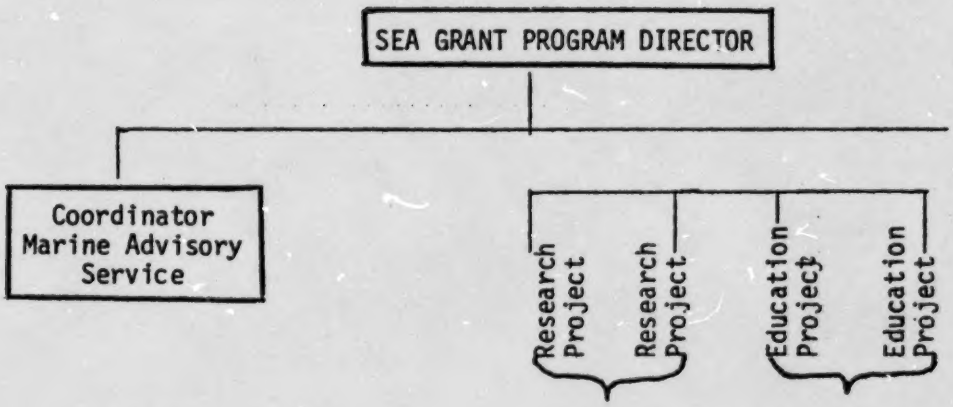
B. The education specialist has responsibilities similar to those of other advisory specialists but focuses his/her efforts on education.

C. The coordinator of the marine advisory service has programmatic and/or managerial responsibility for the education component.

D. Education projects with individual principal investigators operate under the supervision of the education specialist.

Model #3

Diagram



Open ended . . the number of projects is variable

Characteristics

A. The education component is separate, distinct and co-equal with the marine advisory service and the research components, but

B. The Sea Grant Program Director assumes direct responsibility for both the education and research components.

C. Each education project has its own principal investigator, just as each research project has its own principal investigator, all reporting directly to the Program Director.

9. Communication from National Sea Grant College Program with Institutional Programs; Appointment of Liaison Persons

National Office (Barbara Spector) will ask each institutional Director to designate a contact person for marine education. Future communications with contact person will have a carbon copy to Director.

10. Better Communication with Program Directors

Barbara Spector will brief Directors of the status of the marine education initiative. Recommended inclusions:

(a) define and determine contact person in each Program

(b) list of ongoing projects

(c) outcome of this meeting

(d) vocabulary - definitions

(e) scope & diversity of marine education

(f) value to Directors in the institution & community of strong marine education component

(g) MEMS - description and status

(h) handling of marine education proposals

- avoid duplication of effort
  - product - check MEMS for completed items
  - program - check OSG for products under development elsewhere
- product - require to put it in MEMS
- site team - get education expertise represented; request to NSGCP
- internal institutional review - get help from state ed. agency
  - get help from college of ed.

11.. Communications

Barbara suggested the possibility of setting up conference calls as one effective means of communication between marine educators. It was recommended that other avenues of communications be explored also.

It is neither an appropriate, cost-effective or efficient use of time to utilize financial resources for Marine Education workshops before a precise and pressing need for such workshops has developed and been clearly demonstrated.

Barbara will work closely with George Lowe to secure funds for workshops related to criteria setting and quality assessment of materials.

12. Direct Student Contact: Cost Effectiveness

A discussion took place arising from the observation that in many places Sea Grant personnel spend considerable time in direct contact with students, in addition to training teachers. The advantages of this direct contact are (1) insight into the ways in which students interact with the materials, providing baseline data for improving strategies to help teachers help students, (2) first-hand reward by being with students who are excited by the Sea Grant person's work.

The disadvantages of Sea Grant personnel having direct student contact is the immense amount of time used to reach a limited number of students. The question raised is this: can one person, because of the ripple effect, ultimately serve more students by creating materials and/or training teachers than by interacting directly with the individual youngsters?

C. Luncheon Meeting

On February 22, 1979, the entire group had lunch with Logan Sallada, Jack Willis (President's Reorganization-Office of Management and Budget), and George Lowe (Technical Advisor for Marine Education in U.S. Office of Education). All three were enthusiastic, encouraging, and offered their expertise and support for the Sea Grant Marine Education endeavor.

The need for a knowledgeable educator to be included on every site visit team considering education proposals was stressed by participants. Barbara requested that names and vitae of qualified individuals be directed to her.

D. Vocabulary

It was agreed that there is an urgent need to establish a common vocabulary to avoid misunderstanding when we communicate with each other. In order to save time, the decision which definition will be used is arbitrary. Whenever possible, the definitions will coincide with those used in other federal education agencies. The words identified thus far are:

education - teacher-learner instruction

traditional education - matriculation for a degree

continuing education - instruction usually designed for adults that does not lead to matriculation

on-going education - program presently in progress

formal education - instruction in a school setting

Marine Advisory Service = Marine Advisory Program = Sea Grant Extension Program

dissemination - the distribution of materials and their use by teachers presenting the materials to their students

Marine Education Coordinator/Director - A person with managerial decision-making and coordinating responsibilities for education in K-12, community college, undergraduate and graduate levels. (We agreed not to attempt a definition for the role and description of a Marine Education Specialist because this designation is used throughout the system to mean a great variety of roles.)

E. Other Activities and Discussions

1. Identification of existing projects

2. Lundie Mauldin brought (and distributed to us) the Questionnaires pinpointing Education contact people and Education programs in each state within the Sea Grant network. Lundie and John McMahon will distribute these to all who have submitted a complete questionnaire.

mailing label lists will be derived from these questionnaires. Some states may have more than one person actively involved in Sea Grant Education (on a decision making level). They should take it upon themselves to determine who is most appropriate as liaison between Barbara Spector and state Sea Grant educators. The designated key contact person will then alert others in his/her state.

The original idea for this questionnaire arose as response to concerns voiced at the October 1978 Sea Grant Association meeting. Of the 28 questionnaires, 22 were answered. In order to produce, finally, a complete listing, Lundie will write personal letters to the Great Lakes Sea Grant programs and Bob Abel in New Jersey.

3. Meeting participants distributed information about their programs; no specifics concerning the content of the programs were shared formally at the meeting.

4. For information concerning marine education projects and programs outside of the Sea Grant network, it was suggested that the Smithsonian Science Information Exchange should be consulted.

5. Unfinished Business.

   (a) How should the questionnaires be updated?

   (b) How can education programs/proposals that are submitted to the OSG and are contained in advisory proposals, be identified?

   (c) The communications network: How should it be organized and managed?

F. Possible Sea Grant - Cooperative Extension (4-H) Cooperation (outside of MAS component)

With the background of past agreements - such as Ocean Engineering

and Marine Advisory Services in mind - we propose a further cooperation between Sea Grant and 4-H Programs (a part of the Cooperative Extension Services) to further the dissemination of K-12 marine and aquatic (M/A) education, utilizing existing channels.

Such an agreement, be it informal or formalized in a memorandum, would make best use of resource people, facilities and materials to help meet the goals of both programs.

Sea Grant - offering expertise in the M/A and will work to control and define quality curriculum framework.

Cooperative Extension Service with its well-established network in each state can be trained to carry forth (disseminate) M/A materials.

Ultimate goal: To further join M/A education.

G. The letter to each Chief State School Officer from Charles Clark, Chairman of the Council of Chief State School Officers' Marine Education Committee was discussed. (copy is attached among the meeting handouts)

ROLE OF STATE EDUCATIONAL AGENCIES

1. Present role of State Education agencies (SEA's) Contact:

(a) mostly informal contacts between local Sea Grant individuals and SEA friends.

(b) most participants expressed desire to continue making own contacts.

(c) many SEA contacts are subject matter specialists (Science & Eng. Ed.). Some need expressed to get participants from middle management involved.

(d) In many cases SEA contacts do not presently take an active part in dissemination and implementation activities of Marine Education materials.

2. Need - Sea Grant Education material is not reaching teachers

(a) SEA contacts & coordinators can assist Sea Grant in dissemination/implementation.

(b) SEA can publish and organize inservice training within a state.

(c) SEA can assist in curriculum design.

(d) SEA can help Sea Grant come in contact with classroom teachers.

(e) SEA can assist Sea Grant in working with outside professional organizations, e.g. NSSA, NCSS, CSSS, NSTA, etc.

3. Recommendation

Sea Grant could offer expertise to assist SEA's with Marine Education, establishing an atmosphere of support and cooperation. This could be stimulated by a letter from the Sea Grant Director to the Chief State School Officer.

1. That State Department personnel be involved in Sea Grant planning activities and that Coordinators be named for each state.

2. That SEA representatives be asked to help facilitate the dissemination process on a local and national scale.

3. That Sea Grant education representatives, SEA representatives, curriculum specialists, generalists, teachers, etc., meet in order to consider

- criteria
- goals and objectives
- the question of marine literacy
- dissemination

H. Quality Control

Among the dozen or so needs that the meeting perceived for the purpose of consolidating and furthering the position of the marine education component within the Sea Grant network and in the nation, the need to assure that only education material of the highest quality is released to teachers and general public was discussed on several occasions. The topic had received urgent attention on several previous meetings of marine educators over the last years because of the mistakes and misinformation contained in a number of marine education documents. It was agreed that implementation of a quality control mechanism is fraught with serious dangers; on the other hand, neglecting to address this problem was deemed to be even more destructive to Sea Grant in general and the education component in particular.

We need to work out (a) criteria for evaluation

(b) people who should be involved in the effort

(c) management of the process

(a) Criteria to be addressed: Accuracy, Factuality, Bias, Sexist, Style, Language, Appropriateness, etc.

(b) People: State education department people

Subject content specialists of a broad variety

People who know something about methodology

Teachers, not necessarily only present marine educators

Dissemination specialists, experts

Curriculum specialists

Textbook persons and publishers

NMEA - members

Sea Grant Association members

E.R. Pariser will start to get a voluntary, tentative, exploratory

group of educators together, to look at material about to be published. Set up a group of people for workshop very soon to discuss criteria for evaluation, people who should be involved, and how the program should be managed.

I. MEMS - Support

Important to support, and work with, MEMS. This point received very strong emphasis. Updating of the nature and status of marine education proposals and the dissemination of updated documents is vital to keep the network informed. Lundy M. has taken the first step and will ask for confirmation. There was unanimous opinion that whatever support needs to be given to MEMS should be given to the organization in order to accelerate MEM's work; MEM's effort and success are truely a conditio sine quo non for the success of marine educators' work.

J. Addendum

The following information was obtained after the meeting in February.

John McMahon (president of NMEA) and I had a lengthy discussion about the relationship of OSG, NMEA, and the Sea Grant Association. We also discussed specific tasks in which OSG and NMEA could collaborate. I had a similar discussion with Bob Abrams (president-elect of NMEA).

As you can see from the enclosure, I rewrote the strategy paper immediately after our February meeting. I look forward to your comments on it.

Then I attended the following annual meetings and directors' meetings in Atlanta in March, 1979.

- National Association for Research in Science Teaching (NARST)
- Association for Educators of Teachers of Science (AETS)
- National Science Teachers Association (NSTA)
- National Science Supervisor's Association (NSSA)

-Council of State Science Supervisors (CSS)

-Council of Elementary Science International (CESI)

The purpose of interfacing with people in these organizations was to convince them to pass policy statements and/or position statements encouraging their members, and the education community as a whole, to focus attention on Marine Education and design activities to forward Marine Education in the Nation's schools K-12.

As its first overt step toward this end, each group was asked to designate a liaison to a group of liaisons from national professional organizations in all disciplines.

Mission accomplished!

The six liaisons had their first meeting in Atlanta. These six people will compose the steering committee of this liaison group.

The liaisons are: NARST - Roger Olsted, AETS - Gladys Kleiman, NSTA - Sam Mitchell, NSSA - Al Shutte, CESI - Barry Van Denman, CS^3 - Ray Thiess.

Ray Thiess will be the liaison group's representative to the Washington D.C. scene.

All these people are incredibly enthusiastic and talented. Also in Atlanta, the twelve directors from the National Council of Social Studies were introduced to Sea Grant Marine Education. So the mechanism has begun for that group to become involved.

At NSTA, the comment I heard most frequently when people heard what I was doing was something like "I'm glad I'm not alone anymore." The large scale Sea Grant effort is really being welcomed by those who have been doing Marine Education as "their own thing" for many years.

Also at NSTA, which incidentally has approximately 40,000 members and affiliates, there was a meeting of the presidents of the state

chapters and affiliate groups that compose NSTA. Each state leader received a copy of Goodwin's The Need for Aquatic and Marine Education. Many of them received a copy of the Sea Grant Education Initiative for K-12 and Related Teacher Training. The others will receive them through the mail. This is the initiation of the state level involvement of professional organizations. --FLASH-- In Hawaii, I met with the newly installed President of the National School Boards Association (NSBA), Mr. H. Yamashita. He expressed interest in presenting a policy statement to his Board of Directors encouraging Marine Education. NSBA represents 16,000 local Boards of Education from across the U.S. Their annual meeting includes four days of clinics during which members are informed about topics useful in their decision making capacity. Mr. Yamashita indicated he would investigate the possibility of Sea Grant conducting Marine Education clinics for the four days at their next annual convention, April 1980 in San Francisco.

I have initiated contact with several major textbook publishing companies. Strategies to get them involved with publishing marine materials have begun. Any suggestions you have in this area would be most welcome.

Twenty-seven states have appointed a Marine Education Coordinator in their SEA. More are on the way.

N.S.F. and O.E. are both sending representatives to the PASGAP meeting in Hawaii to give information on funding as it relates to topics discussed in Hawaii.

Linda Sadler of CZM will be assisting me with the NOAA Marine Education thrust headed by the Sea Grant office.

There have been two reorganizations in USOE that may prove especially interesting to us. A new bureau has been formed called the

Office of School Improvement . (See enclosed news release.) Deputy Commissioner Ellis has a new special assistant named Bob Mulligan. Chuck Hanson, his former assistant has become Deputy Director of Bilingual Education. Hanson's new assignment might provide some opportunities for involving the bilingual dimension in more Marine Education programs since Hanson has been aware of my efforts and has been helpful.

Bob Mulligan's background includes Marine Education going back a decade or so at Newport. He pioneered some Marine Education materials in the early days of ESEA Title III.

Negotiations are continuing with O.E. towards getting money to do the specific tasks we talked about in February. The internal changes in O.E. have temporarily reduced the speed of our catapulting success story, but we are building up momentum again as of April 16. The meeting between John Ellis and Bob Shephard for March 13, was cancelled by Ellis because of O.E.'s hearings and internal issues. It will be reset.

It would be desirable to compile a reference list of marine centers around the country that teachers can use for field studies. This information could be distributed via MEMS.

Please send me names and brief descriptors of people who would be good site-visit team members when education proposals are involved. Also it would be helpful to have a list of names of appropriate people for written peer reviews. On the list please indicate those you have used and those not yet used.

It would be helpful for me to gain a better understanding of the proposal review system used in Sea Grant programs. Therefore, I'd appreciate it if you would send me a copy of the cover letter and any other information that your program sends to reviewers of your education proposals.

My followup on the recommendation that Sea Grant utilize the

Extension System (and 4-H) revealed that a Memorandum of Agreement exists on the National level tieing Sea Grant to the Extension System. Similar agreements exist on a local level in 22 Sea Grant programs, thereby enabling the use of the Extension System for Sea Grant Marine Education in those places.

Since the February meeting, two Sea Grant Programs have added Marine Education leaders (coordinator-director) to their programs.

The concept that Marine Education is an integral part of all education for literate citizens is blooming in places some Sea Granters find surprising, namely, land-locked states. The University of Nebraska and the Nebraska State Education Agency are co-sponsoring a convocation for teachers on Marine and Aquatic Education in June, 1979. Any goodies (materials and/or words of wisdom) you would like me to share with those people, please let me know by June 5, 1979. Those of you with experience starting Marine Education Associations might want to provide me with some thoughts in that area - a Nebraska Marine Education Association - WOW!

The President of the Kansas Advisory Council for Environmental Education has offered to join in our efforts to infuse Marine Aquatic education in schools K-12. - A Kansas MEA?!

At present I am anticipating there will be at least three opportunities for Sea Grant Marine Education people to meet to work on common concerns. One meeting will be either August 11 and 12, or 12, 13. THe NMEA Director's meeting starts August 14 in the afternoon. In order to get the one full day off as agreed on, we would have to meet Saturday and Sunday. That is before the NMEA meeting in Milwaukee; which is your preference? A second meeting could be possibly October 29, 30 which would be after the Sea Grant Association meeting in Orlando. What do you think?

I'm hoping the tasks of writing a conceptual framework for marine

education and setting evaluation criteria will have begun before that. If not, those topics will be the total focus of these meetings. If these tasks are already in progress we will be able to use our time for additional topics identified in February. What do you think about these topics? Do you have any addition or priorities?

1. Copyright and government supported material development presented by a lawyer from NOAA.
2. Management training type workshop designed to provide information to Marine Education leaders which will assist them in gaining entree to school systems and in maximizing help from people already interested in Marine Education.
3. Teacher training models.
4. Statewide dissemination-implementation models.
5. Federal funding sources additional to Sea Grant, potentials for Pass-through grants.

Special thanks to Ray Pariser for facilitating getting these Proceedings in intelligible form and getting them typed.

APPENDIX I

Dale Baker
University of Minnesota, Sea Grant Program
Office of Director
132 A Hodson Hall, 1980 Folwell Ave.,
St. Paul, Minnesota 55108 /Dear Mr. Baker/

Ms. Dorothy Bjur
University of Southern California
Sea Grant Program, University Park
Corwin D. Denny Research Bldg., Room 298
Los Angeles, California 90007 /Dear Ms. Bjur/

Dr. Alyn Duxbury
Sea Grant College Program
Division of Marine Resources
University of Washington, HG-30
Seattle, Washington 98195 /Dear Dr. Duxbury/

Dr. David Gillespie
School of Biology
Georgia Institute of Technology
Atlanta, Georgia 30332 /Dear Dr. Gillespie/

Mr. Harold Goodwin
6212 Verne Street
Bethesda, MD 20034 /Dear Mr. Goodwin/

Dr. Lori King & Mrs. Vi Lin
Sea Grant College Program
Center for Marine Resources
Texas A & M University
College Station, Texas 77843/Dear Dr. King & Mrs. Lin/

Mr. Jim Lanier
Sea Grant Program
Virginia Institute of Marine Science
Gloucester Point, VA 23062 /Dear Mr. Lanier/

Ms. Lundy Mauldin
The University of North Carolina
Sea Grant College Program
105 1911 Bldg.
North Carolina State University
Raleigh, N.C. 27650 /Dear Ms. Mauldin/

Ms. Julia Steed Mawson
Marine Advisory Program
University of New Hampshire
Marine Program Bldg.
Durham, N.H. 03824/Dear Mrs. Mawson/

Dr. Jim McCloy
P.O. Box 1675
Galveston, Texas 77553 /Dear Dr. McCloy/

Mr. John J. McMahon
Marine Option Program
Blue-Water Marine Laboratory
University of Hawaii
2560 Campus Road, George 230
Honolulu, Hawaii 96822 /Dear Mr. McMahon/

Dr. Paul Nowak
3012 B Dana
University of Michigan
Ann Arbor, Michigan 48109 /Dear Dr. Nowak/

Ms. Linda O'Dierno
Cornell University/ Cooperative Extension
17th Floor, 111 Broadway
New York, N.Y. 10006 /Dear Ms. O'Dierno/

Dr. Ray Pariser & Dr. Jay Kaufman
Massachusetts Institute of Technology
Sea Grant Program, Room E38-302
77 Massachusetts Avenue
Cambridge, Mass. 02139 /Dear Dr. Pariser & Dr. Kaufman/

Mrs. Rose Pfund
Sea Grant Program
University of Hawaii
2540 Maile Way, Spal. 252A
Honolulu, Hawaii 96822 /Dear Mrs. Pfund/

Dr. Alida Ortiz Sotomayor
Program "Sea Grant"
Universidad de Puerto Rico
Colegio Universitario de Humacao
Apartado 428
Humacao, Puerto Rico 00661/Dear Dr. Sotomayor/

Dr. Prentice Stout
Marine Advisory Service
University of Rhode Island
Narragansett Bay Campus
Narragansett, Rhode Island 02882 /Dear Dr. Stout/

Mr. Ray Thiess
Specialist Science Education
Oregon Department of Education
942 Lancaster Drive N.E.
Salem, Oregon 97310 /Dear Mr. Thiess/

Mrs. Barbara Waters
c/o Dr. David Ross
Sea Grant Coordinator
Woods Hole Oceanographic Institution
Woods Hole, Mass. 02543
/Dear Mrs. Waters/

APPENDIX II

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Rockville, Maryland 20852

National Sea Grant College Program

February 7, 1979

Dear

You are invited to attend the first in a series of small informal meetings with Sea Grant personnel across the country. The meeting will take place on February 20, and 21, 1979 from 8 a.m. to 5 p.m. both days. The location is room 926 - WSC 5, 6010 Executive Boulevard, Rockville, Maryland. (This is a conference room in the same building with the Office of Sea Grant.)

PURPOSE:

The purpose of this meeting is to establish means to maximize the use of the Marine Education expertise presently existing in the National Sea Grant College Program. In order to do this it is necessary to expand communication channels within the Sea Grant network for those people concerned with Marine Education. Toward this end it is desirable for each participant to familiarize him/herself with the "Education and Training" programs existing in each of the other programs prior to attending this meeting. Therefore, it would be greatly appreciated if you would write a description of this aspect of your program. If time permits, please distribute this material to the participants on the enclosed list. If not, bring copies with you for distribution on arrival.

PREPARATION

It would be helpful to include information about the following items in your description: Within your Sea Grant Program --

(1) What is your management arrangement for Marine Education? Please refer to both the formal and informal structure, and lines of communication presently existing in your program?

(2) What activities are taking place in your program that relate to the broad title, "Education and Training?"

(3) How are the preceding activities categorized or labeled (if at all)?

*(4) How is Marine Education defined within your Sea Grant Program?

*(5) What are the principal criteria and elements that make marine educational goals and activities coalesce into a separate and effective Sea Grant Program component.

(6) How does your Marine Education program fit and/or relate to the description in the FRAMEWORK FOR MARINE AND AQUATIC EDUCATION: The Sea Grant Education Initiative K-12 and Related Teacher Training? (Each Director

received a copy).

In order to begin on common ground, three documents that provide some historical perspective on Marine Education efforts are enclosed. They are (1) Perspectives on Sea Grant Marine Education (2) National Advisory Committee on Oceans and Atmosphere: Issues for Discussion, and (3) Education and Training in the National Sea Grant College Program -Fy 78.

OUTCOME:

It is anticipated that the information gathered at this meeting will suggest means to maximize the use of the Marine Education expertise which exists within the National Sea Grant College Program by: (a) providing a common baseline of understanding of vocabulary in use in the network, (b) minimize duplication of efforts, and (c) increase coordination and cooperation within the Sea Grant network.

All this will provide the groundwork for efficient working of the Office of Sea Grant and the Sea Grant network with those outside the National Sea Grant College Program to forward Marine Education in the U.S., including (1) State Departments of Education (2) U.S.O.E., N.S.F., and other Federal Agencies (3) professional education organizations (4) community and civic organizations, (5) individuals concerned with Marine Affairs.

Please bring your copy of the FRAMEWORK FOR MARINE AND AQUATIC EDUCATION . . ., and the enclosed documents to this meeting.

The closest motel to the office, is one mile away. It is the Colonial Manor on Rockville Pike. Please see enclosed reservation card. If you decide to stay there, please return the card directly to the motel immediately with the necessary deposit or guaranteed reservation. When showing NOAA travel orders the rates are $22, including tax, for a single, or $26.40, including tax, for a double.

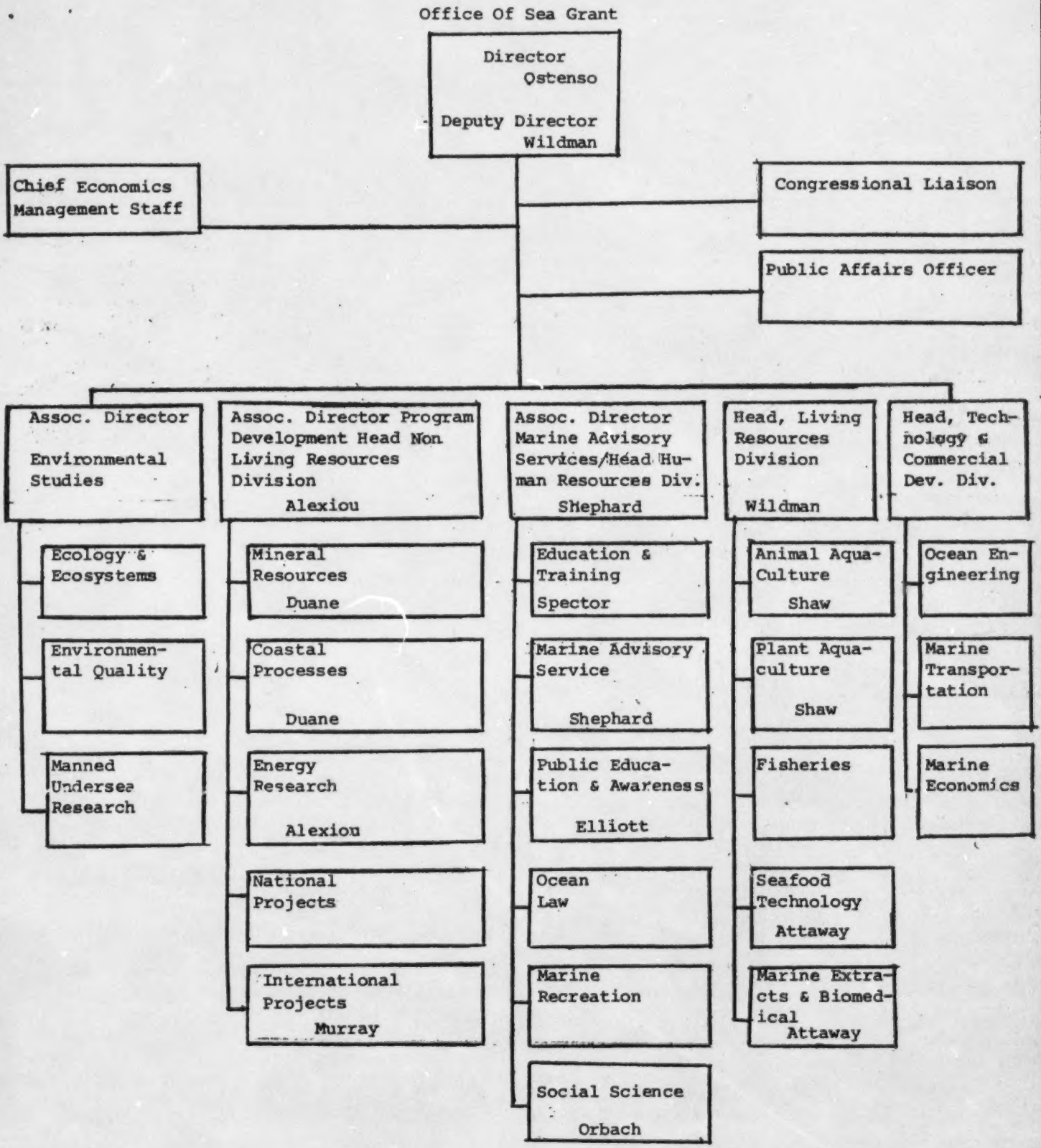
I look forward to seeing you.

Cordially,

Dr. Barbara S. Spector
Program Director for Education
National Sea Grant College Program

*suggested by Dean Horn

APPENDIX III



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California Superintendent
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WAYNE TEAGUE
Alabama Superintendent
of Education

CAROLYN WARNER
Arizona Superintendent
of Public Instruction

Executive Director
WILLIAM F. PIERCE

CHIEF STATE SCHOOL OFFICERS • COUNCIL •

February 12, 1979

MEMORANDUM

TO: Chief State School Officers

FROM: Charles Clark, Chairperson
Marine Education Committee

SUBJECT: Request for Marine Education Coordinator

As indicated in the attached report by the Marine Education Committee to the Council of Chief State School Officers at the November, 1978 meeting, the importance of developing an awareness of the world of water should be a priority consideration in the educational process. More specifically, the utilization of marine and aquatic references in the place of the more traditional land orientation can be extremely beneficial in increasing sensitivity toward the prominence of water in the American life and society. Emphasis should be placed on the concept of infusing knowledge and awareness of marine and aquatic education in all areas of the curriculum, rather than adding marine science as a separate discipline.

To initiate appropriate consideration by State Education Agency staff in the promotion of this concept we are asking each Chief to appoint a staff member to serve as a marine education coordinator. Once appointed this individual will receive information from a variety of sources to assist this individual in definition of appropriate activities.

I have included a brief description of the role and qualifications Committee members and representatives of National Organizations have identified as being desirable to accomplish the objectives of this effort. Additionally, I have enclosed two Sea Grant publications and a form to be used in establishing a mailing list for those appointed to serve as a contact within each State Education Agency.

/cl
Enclosure

cc: William F. Pierce

COMMITTEE ON MARINE EDUCATION
REPORT TO THE
COUNCIL OF CHIEF STATE SCHOOL OFFICERS
November 15, 1978
Safari Hotel
Scottsdale, Arizona

The Committee on Marine Education exists as a recognition by the Council of Chief State School Officers of the importance of marine and aquatic education and the need to identify the most appropriate role the Council can play in ensuring the development of, and sensitivity toward, the importance of water to American life and society. The Committee endorses the concept that marine education encompasses a need to infuse a knowledge and awareness of the importance of the world of water in all areas of the curriculum. It is not limited to marine science education nor is it a discipline in and of itself.

The Committee established its first two objectives. They are (1) generation of a marine education policy statement, and (2) development of a position paper defining procedures and strategies to effectively increase marine education literacy. The policy statement will be reviewed at the May Commissioner's meeting and, if approved by the Marine Education Committee, presented to the Policy Committee for their consideration in the development of the next year CCSSO "Policy Statements." The position paper will articulate the need for and the basic assumptions related to education about the world of water. It will include procedures for increasing awareness at the local level; identification of available resources; mechanisms to access resources; and related items.

The Committee recommends that each Chief State School Officer appoint a staff member from the State Education Agency to serve as a marine education coordinator. It is preferable that this individual have a generalist responsibility as contrasted with a science emphasis. The person need not have expertise in a marine field. Materials will be provided and resources made available to assist the person in the infusion of information about the world of water across curricular areas. More information concerning this role will be provided in the near future. A request will follow for the designee's name, title, and address to facilitate a mailing list.

During the coming year, continued contact with organizations having similar objectives such as the National Oceanic and Atmospheric Administration's Office of Sea Grant, the National Marine Education Association, and the Office of Education will be maintained to ensure a cooperative, coordinated effort. Formal linkages will be defined when appropriate to ensure maximum accessibility of available resources and to demonstrate support in achieving mutually beneficial goals.

ROLE AND QUALIFICATION
RECOMMENDATIONS FOR
STATE MARINE EDUCATION COORDINATORS

DEFINITION OF MARINE EDUCATION: "Marine and aquatic education is that part of the total educational process which enables people to develop a sensitivity to and a general understanding of the role of the seas and fresh water in human affairs and the impact of society on the marine and aquatic environments." (Goodwin, 1978) This definition intentionally applies to all disciplines and is not limited to science. A complete rationale is contained in the enclosed publication by Goodwin.

ROLE OF STATE MARINE EDUCATION COORDINATOR

A. Investigate the role state level curriculum area specialists can play in infusing marine education into their area of speciality. Ensure that specialists are aware of the importance of this topic and facilitate coordination between and among area specialists and the provision of available materials.

B Design strategies to disseminate information about, provide assistance to, and promote the incorporation of marine education at the local district level.

C. Serve as a contact and focal point for State and Local Education Agencies in receiving Marine Education information.

The individual should be in a position to impact a wide range of disciplines. A generalist responsibility is viewed as being more important than a science emphasis or background. A marine education background is not considered to be of great importance as information and a proposed network as a support system are being defined and the state coordinator will be kept current on newly emerging resources. One of the main thrusts in the coordination of this effort is from the National Oceanic and Atmospheric Administration's office of Sea Grant. Further information may be obtained by contacting:

Dr. Barbara S. Spector
Office of Sea Grant
National Oceanic and Atmospheric Administration
6010 Executive Boulevard
Rockville, MD 20852

I AM NAMING

NAME _____

MAILING ADDRESS _____

_____

_____

TO REPRESENT _____
(STATE)

AS MARINE EDUCATION COORDINATOR

_____
SIGNED

Please return to:

CCSSO
400 North Capitol St., N.W.
Suite 379
Washington, D.C. 20001

Attention: George Rush

SUGGESTED ACTIVITIES FOR MARINE EDUCATION TASK FORCE OF THE F.I.C.E.

SUBCOMMITTEE ON ENVIRONMENTAL EDUCATION

These suggestions resulted from an informal needs assessment on the "state of the art" of Marine Education in the U.S. today. There are needs evidenced in two areas. They are (A) material resources, and (B) communication among Marine Educators.

A. Material Resources

There is a need to identify resources, assess their content and quality applicability, and make them available to others. Therefore, these tasks are suggested:

1. Refine and expand the draft of the Categorical Index of HEW Education Division Programs that could be used for Marine Education efforts. Expand the draft to include those Federal agencies represented in FICE.

2. Initiate a process to identify Marine Education related projects presently being funded in Federal agencies.

3. Sponsor a workshop to formulate a Marine Education framework derived from the document Fundamentals of Environmental Education (FICE,1976),

4. (a) Identify ME programs in the U.S. that are already in place.

   (b) Assess quality, content and applicability of programs and materials.

   (c) Create an index of exemplary programs including and abstract with goals, sources of support.

B. Communication Among Marine Educators

There is a need to enhance and expand communication among those interested in Marine Education. Such people are in colleges, universities; Federal, State, and Local Education Agencies; professional education organizations; Natural Resources, Environmental/Conservation organizations, and business and industry. It would be desirable to maximize opportunity for human contact to facilitate direct communication and information exchange. Therefore, these activities are suggested:

1. Sponsor a workshop for Marine Education Coordinators from each of the State Education Agencies. This meeting would be to inform these coordinators of the available support systems and resources (human and material), in addition to updating the state of the art of Marine Education. (In Nov. 1978 the Council of Chief State School Officers' committee on Marine Education recommended that each state education agency appoint a coordinator for Marine Education -- see attachment)

2. Sponsor a meeting for Title IV Directors from all the states to encourage these directors to devote part of their Title IV money to Marine Education activities. i.e. contribute to the development and validation of program models to incorporate into the National Diffusion Network.

EDUCATION AND TRAINING GOALS AND OBJECTIVES

OVERALL EDUCATION AND TRAINING GOAL

To build and maintain broad, high-quality curricula for education and training of qualified professionals and technicians to meet requirements for the development and management of the nation's marine resources; continuing education opportunities for practicing professionals, technicians, and decision-makers engaged in marine-related activities; educational exchange programs; public education at all levels to increase public awareness and understanding of the realm of marine affairs and enjoyment of the sea; and other stimulating and innovative educational activities to further the general goals of Sea Grant.

The Declaration of Purpose of the Sea Grant Act states "that it is in the national interest of the United States to develop skilled manpower, including scientists, engineers, and technicians . . . necessary for the exploitation of these (marine) resources . . . " and directs that the cognizant agency shall exercise its authority under the Act by "initiating and supporting programs at Sea Grant colleges and other suitable institutions, laboratories, and other public or private agencies for the education of participants in the various fields relating to the development of marine resources . . ."

Purpose of the Act also is to increase enjoyment and use of our marine resources. Still another stipulation of the Act is the "encouraging and developing programs of instruction, practical demonstrations, publications . . . with the objective of imparting useful information to persons currently

employed or interested in the various fields related to the development of marine resources, the scientific community, and the general public."

The educational and training mandate is clear, broad, and pervasive, not only for the preparation of specialists for marine careers, but also for increasing public awareness and capacity for the enjoyment of our marine resources.

Education and Training activities of the National Sea Grant Program are classified under five subgroups as follows:

I. Professional Education

II. Vocational Marine Technician Training

III. Continuing Education

IV. Educational Exchanges

V. Public Education

I. PROFESSIONAL EDUCATION

GOAL:

To initiate and improve a broad range of marine-related courses in Sea Grant institutions for the training of scientists, engineers, social scientists, lawyers, and other qualified professionals to meet public and private sector manpower needs in the development and management of marine resources.

The National Sea Grant Program recognizes the need to support improvement and initiation of new university courses and programs that strengthen or change the scope of the marine-related curricula of developing Sea Grant institutions. This upgrading and development does not include the

assumption by Sea Grant of basic educational support which is appropriately the responsibility of the institution itself. However, it is recognized that many courses and, in some cases, entire degree programs must be continuously revised and upgraded to include new material, techniques, and recent advances in other fields of resource development so as to maintain their effectiveness and be responsive to actual marine resource problems and opportunities. In order to achieve their goals, some courses require travel support in connection with the use of coastal laboratory and ship facilities. Costs for these activities are not normally included in institutional education budgets, and to ask the student to assume these costs out of his or her private resources, often results in personal hardship. Therefore, the National Sea Grant Office may in certain instances consider support of a continuing nature for such special educational activities not normally supported by an institution.

The Office of Sea Grant has made a practice of providing support for the upgrading of basic marine sciences courses, but normally does not support the initiation of courses in this area. Institutions are encouraged to develop new or strengthened course offerings that relate to and are supportive of the broad Sea Grant objectives of development, utilization, and management of marine resources. These may include marine animal health, fisheries, aquaculture, seafood technology, marine and coastal engineering, marine socio-economics, ocean law and other appropriate marine-related subject. Not all Sea Grant institutions are expected to develop courses in all of these specialties. Course development will normally be controlled by institutional capabilities and goals and by regional needs and opportunities.

The approach of the Office of Sea Grant to support in the building of new degree programs has been conservative, primarily because of the uncertainties inherent in the process of projecting future professional manpower requirements. The ultimate test in the evaluation of marine-related curricula will be the employability of the graduates.

As the Sea Grant Network becomes more mature, emphasis in professional education is expected to shift primarily to the upgrading of existing graduate level courses for the incorporation of new concepts and technology. The initiation of interdisciplinary orientation courses and seminars to provide a broad overview of developments and trends in marine affairs at state, national, and international levels may be desirable. Sea Grant institutions will be encouraged to design and experimentally offer new and innovative courses that respond to emerging issues or new areas of technology. Such courses may be particularly important in the light of impending changes in the management of coastal zone resources, the international law of the sea, and the acceleration of offshore petroleum and mineral development.

Experience gained by graduate students through participation in Sea Grant research can be an invaluable part of professional education. Therefore, institutions of the Sea Grant Network are encouraged to utilize graduate students as research assistants on Sea Grant research projects. Research experience may also be provided through student research participation programs that permit students to plan and conduct team research as a part of their course work. Sea Grant institutions are also encouraged to utilize graduate students in advisory service activities where appropriate.

PROFESSIONAL EDUCATION OBJECTIVES

1. To continually strengthen and improve basic marine science and engineering courses through incorporation of new concepts and technology.
2. To develop new and improved courses in areas of applied science and technology relative to the development and utilization of marine resources.
3. To develop new and improved courses in the social sciences and law relevant to the development and management of marine resources and broad issues of marine affairs.
4. To initiate experimental offerings of new and innovative courses that respond to emerging marine issues and the development of new marine technology.
5. To extend the professional education of graduate students through participation in Sea Grant research activities.

II. VOCATIONAL MARINE TECHNICIAN TRAINING

GOAL:

To train personnel qualified in the various marine specialties through vocational and technical training programs to meet manpower needs of marine business and industry and the requirements of state, regional, and national governmental operations.

Sea Grant experience has demonstrated that vocational and technical training programs are most successful when developed by educational institutions that are in close contact with marine industries and other

potential employers of the graduates. Work-study experience gained as a part of the training program also is a factor in the successful placement of graduates.

Demands for graduates with marine vocational and technical training background vary from region to region and from industry to industry. Some sectors of the fishing industry are seeking to upgrade the training and reliability of vessel captains and crews. New U.S. Coast Guard regulations are creating demands for licensed officers on waterway towboats and mobile offshore drilling platforms. Acceleration of offshore mineral exploration and the development of deepwater terminals can be expected to create new demands for technically-trained personnel capable of working in the marine environment.

Sea Grant institutions must assess continuously the needs of their respective regions for trained marine technicians. Vocational and technical training programs are often more appropriately offered by community colleges than by four-year research-oriented universities, so that interinstitutional cooperation is desirable in the development of technician training programs as a part of institutional Sea Grant programs. The involvement of marine industries, which represent potential employers, to assist with planning and to provide financial support and work experience opportunities is highly desirable.

VOCATIONAL MARINE TECHNICIAN TRAINING OBJECTIVES

1. To monitor the marine technician manpower requirements on a continuing basis.

2. To initiate and develop marine technician training programs in appropriate institutions in response to well documented local, regional, or national needs in the development and utilization of marine resources.
3. To seek industry participation and support in the development and presentation of marine technician training programs.

III. CONTINUING EDUCATION

GOAL:

To provide continuing education programs for professional personnel and technicians engaged in marine-related activities for the purpose of communicating knowledge about new concepts and technology pertinent to the development, utilization, and management of marine resources.

The National Sea Grant Program recognizes that learning is a lifetime process. New technological advances and new directions in the development of marine resources and the management of the coastal marine environment will continue to present Sea Grant institutions with challenging opportunities to engage in continuing education programs designed to update and upgrade personnel engaged in marine-related activities in the public and private sectors.

Continuing education programs for technicians engaged in marine-related industries, such as fishing and transportation, may be essential to the economic health of these industries. Sea Grant institutions also may identify needs and opportunities to develop continuing education programs to serve the needs of personnel at all levels of government and

employees of business and industry who are interested in enriching and updating their professional knowledge of marine resources and developments. Special continuing education programs may be especially helpful to decision-makers and their key staff people who will be facing increasingly tough decisions on marine-related issues such as coastal zone management and law of the sea.

Insitutions of the Sea Grant Network engaging in continuing marine education programs should encourage industries and/or governmental agencies to jointly sponsor such programs and contribute knowledge from their own scientific and technological advances by permitting participation of their professional staff members in the presentation of these programs. Continuing education programs quite naturally merge with advisory services, and various Sea Grant institutions may have their own criteria for assigning these programs to education or advisory services for planning and management purposes.

CONTINUING EDUCATION OBJECTIVES

1. To develop continuing education programs for technicians and professionals for the purpose of communicating new concepts and technology to persons engaged in marine-related activities.
2. To seek the participation of business, industry, and governmental agencies in support and presentation of continuing education programs so as to stimulate a free and continuing exchange of ideas and knowledge.

IV. EDUCATIONAL EXCHANGES

GOAL:

To foster educational experiences for faculty and students of Sea Grant institutions and personnel in governmental agencies and marine-related industries through educational exchange programs.

The educational and advisory services goals of the Sea Grant Act can be well served by programs that provide for the exchange of personnel between institutions of the Sea Grant Network and marine-related business, industries, and agencies of Federal, state, and local governments. Such exchanges provide a valuable form of communication and are likely to catalyze the development of new opportunities for cooperation in education, research, and advisory services.

Students can gain valuable insight into marine-related activities by serving internships or participating in work-study programs arranged by Sea Grant institutions in cooperation with public or private sector organizations.

Personnel from marine-related businesses, industries, and governmental agencies can contribute from their practical knowledge and experience to enrich Sea Grant education, research, and advisory programs through exchange programs while at the same time continuing their own professional development in the academic environment. Faculty and staff members engaging in such exchange programs have the opportunity to gain insight into practical problems of marine resources development and management that confront business, industry, and governmental agencies. These exchange programs may make a variety of forms, including exchanges arranged under the Intergovernmental Personnel Act.

Exchanges of staff and students between institutions of the Sea Grant Network can be expected to increase as the Sea Grant programs of these institutions mature and become more cooperative in nature.

EDUCATIONAL EXCHANGE OBJECTIVES

1. To provide internship and work-study opportunities for students to gain knowledge of marine-related activities.
2. To initiate exchange programs involving personnel of Sea Grant institutions and personnel of marine-related businesses industries, and agencies of various levels of government.
3. To stimulate exchanges of students and personnel between institutions of the Sea Grant Network.

V. PUBLIC EDUCATION

GOAL:

To increase public awareness and understanding of the economic, social, and aesthetic values of the marine environment through credit or non-credit educational programs in order to improve the quality of citizen participation in decision-making processes relative to marine resource issues and to enhance the enjoyment of the sea.

The Act stipulates that the National Sea Grant Program encourage and develop "programs consisting of instruction, practical demonstrations, publications, and otherwise . . . with the object of imparting useful information to . . . the general public . . ." and that attention be directed to " . . . the enjoyment and use of our marine resources . . ." Within this context it is appropriate for Sea Grant institutions to engage

in public education programs at various educational levels to increase public understanding of marine matters and to expand capabilities of people to enjoy the sea.

At the college level there are many opportunities for designing credit courses to serve general education objectives covering topics such as a survey of marine affairs or the history of the marine sciences. There are also opportunities to develop cultural courses that relate to the arts and humanities of the sea.

The development and introduction of blocks or units of marine-related curriculum materials and teaching aids can contribute to improved elementary and secondary education programs in the sciences and social sciences. Teacher preparation programs are essential to the successful adoption of new teaching concepts and materials. In-service training programs and summer short courses or institutes afford effective methods for teacher preparation.

Marine-related adult education programs can be diverse in substance and format. These programs may focus, for example, on the broad spectrum of marine affairs or on a more specific topic, such as the history of ocean transportation. The format may range from a series of lectures or group discussions to a formal credit course offered within the framework of continuing education.

Communications specialists have an important role in the design and implementation of the various Sea Grant programs to increase public understanding of the marine environment. There are many challenging possibilities for increasing public understanding and awareness of the

opportunities for enjoyment and use of marine resources. Museum exhibits, radio, television, and other channels of communication may be employed in innovative ways to communicate these opportunities.

Many of the marine-related public education activities undertaken by Sea Grant institutions will complement and be closely interrelated with advisory services, since educational activities constitute an important component of advisory services.

PUBLIC EDUCATION OBJECTIVES

1. To develop and initiate programs at all educational levels to increase public appreciation of benefits derived from the sea and awareness of marine affairs.
2. To initiate college level and adult education programs designed to enhance appreciation of the arts and humanities of the sea.
3. To coordinate and integrate public education programs with advisory services where appropriate.
4. To stimulate innovation in the design and presentation of educational programs utilizing the various media and concepts of communication.

MARINE ADVISORY SERVICES GOALS AND OBJECTIVES

OVERALL MARINE ADVISORY SERVICES GOALS

To assist marine businesses, industries, and governmental agencies in the development and utilization of marine resources and to aid the general public in the understanding, appreciation, and enjoyment of the marine environment through the transfer of scientific, technological and other marine-related knowledge by means of publications, conferences and workshops, other communications media, and field advisory services.

The National Sea Grant College and Program Act calls for the development of advisory services as follows: "Encouraging and developing programs of instruction, practical demonstrations, publications, and otherwise by Sea Grant Colleges, other suitable institutions, laboratories, and public or private agencies through marine advisory programs with the object of imparting useful information to persons currently employed or interested in the various fields related to the development of marine resources, the scientific community, and the general public."

In compliance with the Act, Sea Grant Colleges and Institutions comprising the Sea Grant Network have developed advisory services programs to meet needs of the regions which they serve, and Coherent Projects may include an advisory services component where appropriate. The scope and and quality of advisory services are carefully weighed in considering a Sea Grant Institution for designation as a Sea Grant College. The plan is to extend the advisory services within the Sea Grant Network to serve all coastal states, including those bordering on the Great Lakes, and the island territories. A number of state agencies provide certain marine-

related advisory services which are complementary to those of the Sea Grant Network.

In 1972, the National Oceanic and Atmospheric Administration established the agency-wide NOAA Marine Advisory Services administered by the Office of Sea Grant. This organization serves as a link between the several operating agencies, or Major Line Components (MLC), of NOAA and the various marine advisory services in the coastal states. The Local and regional advisory services developed by the Sea Grant institutions constitute the principal operating units of the NOAA Marine Advisory Services. This relationship further exemplifies the partnership between the Federal government and the Sea Grant academic institutions. The NOAA service also cooperates with other Federal agencies having marine-related responsibilities and interests. These include the U.S. Coast Guard, U.S. Corps of Engineers, Department of Interior, Environmental Protection Agency, and, in particular, the U.S. Department of Agriculture, since several Sea Grant institutions conduct certain advisory service activities through marine components of their state agricultural extension services. The NOAA Marine Advisory Services seeks to complete a national network of advisory services comprised of institutions of the Sea Grant Network and various governmental units which provide certain marine advisory services. The operating agencies of NOAA may channel information to users in the marine field, and field advisory organizations may in turn request NOAA assistance through the NOAA Marine Advisory Services. The Office of Sea Grant recognizes the benefits to be gained through cooperative marine advisory programs among institutions of

the Sea Grant Network, particularly where concerted efforts can be focused on problems of a regional nature. The exchange of advisory data, methods, and expertise between institutions of the advisory network is desirable.

The fundamental goal of the National Sea Grant Program is to identify and respond to local, regional, and national marine-related needs and opportunities through education, research, and advisory services. Attainment of this fundamental goal is dependent upon good communications. Pursuant to the intent of the Sea Grant Act, marine advisory services have been developed by institutions of the Sea Grant Network as a communications mechanism "with the object of imparting useful information." Sea Grant research and advisory services have a strong synergistic relationship. Advisory services serve as an important means to communicate and interpret research results to benefit a variety of marine applications. Marine-related needs and opportunities may be identified and collected through the advisory service network from a wide range of user groups to aid in the planning and direction of future Sea Grant research.

The close interrelationships of education and advisory services are indicated not only in the language of the Act but also by many program activities carried on by institutions of the Sea Grant Network. These relationships are particularly evident in the area of continuing education where programs are designed to aid various user groups and also in those public education programs aimed at increasing public understanding and appreciation of marine resources and affairs. The processes of communi-

cation are essential to both the educational and advisory services activities of the Sea Grant Network.

The Sea Grant advisory network serves many publics and operates at many levels. In the public sector services may be rendered to the self-employed, small businesses, trade associations, and industrial corporations operating within the marine environment. Advisory Services in the public sector may address the needs of legislators or other state and local governmental authorities, as well as those of the general public. Most Sea Grant institutions have trained specialists assigned to field services and communications functions in support of their marine advisory programs. Research personnel often provide advisory service assistance in their respective areas of competence. Sea Grant Directors and their key administrative associates engage in executive-level advisory services relating to program planning and policy-level problems. The Office of Sea Grant recognizes the prevasive and diverse nature of advisory services in the building of strong Sea Grant College and Institutional programs. Because of the complex and diverse range of users to be served through marine advisory services and the numerous sources of expertise drawn upon to provide these services, institutions of the Sea Grant Network are encouraged to develop institutional or state plans for marine advisory services. Such plans can provide the basis for coordinating existing marine advisory activities and serve as a pattern for future development of the network.

More detailed goals and objectives of Marine Advisory Services are

presented under two subheads that follow the General Advisory Services Objectives.

I. Field Advisory Services

II. Communications Services

GENERAL MARINE ADVISORY SERVICES OBJECTIVES

1. To expand the advisory services network of the Sea Grant Network to serve all coastal states, including the Great Lakes, and the island territories.
2. To develop marine advisory services plans for the regions served by the institutions of the Sea Grant Network.
3. To increase the strength and scope of existing marine advisory service programs in institutions of the Sea Grant Netowrk.
4. To strengthen the NOAA Marine Advisory Services as a coordinating body for the marine advisory activities of the Sea Grant Network.
5. To assist institutions of the Sea Grant Network in developing coordinated and cooperative advisory service activities to meet needs of a regional nature and to exchange relevant knowledge and expertise.

I. FIELD ADVISORY SERVICES

GOAL:

To expand the development of field services within Sea Grant Advisory Services so as to provide a Sea Grant presence in coastal communities for the purpose of identifying and responding to problems and needs of marine-related industries, to interpret and seek the application of Sea Grant research and to serve the public.

In deeping with the provisions of the Sea Grant Act, it is desirable, when resources permit, to have marine field representatives stationed in key coastal communities so that they may become intimately acquainted with the problems and needs of the fishing, shipping, and other marine-related industries on the local scene. These field representatives can provide a key element in the Advisory Services of a Sea Grant institution by identifying problems to be studied and assisting with the transfer and interpretation of scientific and technical information for the benefit of coastal businesses, industries, and communities.

The field agents may represent the Sea Grant Program directly or they may be, as is the case in several Sea Grant institutions, a part of, the Cooperative Extension Service and work cooperatively with Sea Grant. These representatives may arrange conferences and instructional workshops, provide field assistance with technical problems, conduct demonstrations, and otherwise represent Sea Grant at the community level, particularly in public education and information activities. These agents will draw on the research capabilities of the Sea Grant Program for assistance with field advisory activities. They will also provide inputs on regional problems and opportunities from user groups on which Sea Grant research may be focused.

Principal Investigators engaged in research are encouraged to communicate with user groups relative to the design of research projects and to report and interpret research findings. User groups represent a valuable source of feedback in planning future research.

FIELD ADVISORY SERVICES OBJECTIVES

1. To develop a network of marine field advisory agents to represent the Sea Grant advisory services in key coastal communities.
2. To assure continuous interaction between field advisory services and other Sea Grant activities to ensure the maximum exchange and use of available information for the development and utilization of marine resources.
3. To increase the interaction of Sea Grant researchers with appropriate user groups for the purpose of communicating and interpreting Sea Grant research results and in order to obtain user inputs to guide future research.

NEWS RELEASE

EDUCATION DAILY, Monday, March 5, 1979

BOYER UNVEILS BUREAU OF SCHOOL IMPROVEMENT

U.S. Education Commissioner Ernest Boyer Friday announced the creation of a new Bureau of School Improvement, designed to bring 23 small discretionary programs together in one location in the Office of Education. "Many of these programs are now located within bureaus that are overshadowed by formula or large grant programs. Placing them in a unit of their own will improve their efficiency and effectiveness and help to assure greater "national impact," Boyer said.

More Efficiency The commissioner added that although each of the programs will continue to operate under its own authority, OE hopes to increase efficiency through the sharing of certain services, such as application and grant processing, panel review and evaluation activities.

The new bureau, expected to become operational within two or three months, will provide a central clearinghouse for the agency's discretionary programs with budgets under $40 million. The bureau will have a combined budget of $110 million this fiscal year and a staff of 130. Boyer said a deputy commissioner to head the new bureau should be named within two to three months.

Which Programs? Existing programs to be placed in the bureau are: Arts in Education, Consumer Education, Community Schools, Drug and Alcohol Abuse Education, Environmental Education, Ethnic Heritage, Metric Education, Right to Read (as part of Basic Skills), School Finance, Teacher Centers, Women's Educational Equity and the Teacher Corps.

In order to comply with their legislative mandate, the Teacher Corps and Drug and Alcohol Abuse programs will report directly to the commissioner.

Several newly legislated programs which are not yet operational are also slated to become part of the Bureau of School Improvement. They are: Biomedical Sciences, Corrections Education, Health Education, Law-Related Education, Population Education, the Preschool Partnership Program and Safe Schools.

Three other Office of Education initiatives will also be included in the new bureau. They are Cities in Schools, PUSH for Excellence and Energy Action. The Bureau of School Improvement will also contain an Office of Comprehensive School Health to foster HEW educational programs relating to smoking, nutrition, immunization and teenage pregnancy, as well as the new health education programs.

Boyer called the decision "one of the most important moves organizationally that the Office of Education could have made." He said he believes it will provide a means for the smaller discretionary grant programs to have a national impact because of the increased access and efficiency the central office will provide. "We should not make it difficult for people who want to get discretionary money out of this office," said the commissioner.